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Particulate creamer comprising fat and food compositions comprising said creamer

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PARTICULATE CREAMER COMPRISING FAT AND FOOD COMPOSITIONS COMPRISING SAID CREAMER

Field of the invention

- 5 The present invention relates to particulate compositions suitable for use as creamer and/or whitener, and in particular comprising triglycerides of fatty acids, wherein the composition is low in triglycerides of trans-unsaturated fatty acids. The invention further relates to food products containing such creamer.

10 Background of the invention

Food compositions (and in particular savoury food compositions) contain in many cases fat. This is especially the case for particulate and/or pasty compositions like preparations for instant cream-style soups and sauces, which to a large extent consist of fat, starch or a starchy matter, and salt and flavourings. Particulate in this context is to be understood as

- 15 powder, flakes, cubes, pellets etcetera.

(Mixtures for) cream-style soups and sauces as above referred, but also other products such as instant dishes like pasta with a sauce often contain an ingredient which is referred to as a creamer, and/or creamer/whitener, and/or creamer/thickener, and/or non-dairy creamer.

- 20 These are usually fat blends that can provide a creamy taste and mouthfeel, improved body and/or viscosity and/or a whitening effect. Such creamers can also be in the form of e.g. tablets as a non-dairy cream alternative. To be suitable in these applications the fat blends must have the appropriate physical properties in terms of melting behaviour, crystallisation behaviour, brittleness, organoleptic properties, taste, as well as physical and chemical
- 25 stability. In order to increase stability, shelf life and solubility, the fat blends are commonly encapsulated or (partly) coated with another material, e.g. hydrophilic film forming materials. In such encapsulates or partly coated fats, the individual fat blend particles as well as clusters of fat blend particles are at least partially covered and/or surrounded by the encapsulation material. The fat blends should therefore also be suitable for being submitted to encapsulation
- 30 and drying processes in order to form free flowing and highly dispersible products.

- The fats in savoury compositions described above usually comprise a considerable amount triglycerides of fatty acids (hereinafter for short: triglycerides). Fats are usually mixtures of various triglycerides. The type of fat or fat blend used for a given purpose is determined (next
- 35 to availability and price) by e.g. the properties the fat has and how it performs in a given

product, and in the manufacture of such product. The fat should perform well on e.g. taste, melting in the mouth, taste keepability, but also on ability to be processed into a suitable product as well as performance in the packed product, e.g. keepability (in particular fat staining for cubes packaged in cardboard).

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The triglycerides (which form part or all of the fat) are usually obtained from vegetable sources and may have been subjected to various treatments, such as fractionation (dry or wet), purification, hardening, interesterification, blending etcetera, to give the fat the desired product properties. Hardening unsaturated fat or triglycerides to saturated or partially unsaturated fat or triglycerides is in particular a tool used to obtain the desired melting behaviour. In this way, oils or soft fats can be turned into fats showing more suitable properties for solid or dry formulations.

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The hardening process may lead to formation of a certain amount of so-called trans-unsaturated fatty acids (and/or triglycerides containing such trans-unsaturated fatty acids), in short TFA's. For various reasons it may be desired to reduce or eliminate the amount of trans-unsaturated fatty acids (and triglycerides thereof) in products. For spreads (margarines and the like) a wide range of possible alternative fats and triglycerides are proposed, as is disclosed in e.g. WO 97/16978 and WO 96/39855.

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The triglycerides mentioned in such applications frequently contain lauric acid (C12 saturated fatty acid). It has been found that when one wishes to find an alternative for the trans-unsaturated fatty acids (and fats containing them) in savoury applications (in which the creamers are often used) lauric acid (and its triglycerides) is undesired. Lauric acid and triglycerides containing lauric acid may show a range of desirable properties, in particular melting behaviour, but in a savoury application triglycerides of lauric acid were found to lead to a (soapy) off-flavour, especially after prolonged storage.

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Hence, there is a desire for creamer, and/or creamer/whitener, and/or creamer/thickener, and/or non-dairy creamer alternative and also (savory) food compositions such as (mixtures for) cream-style soups and sauces, (instant) food compositions, meal makers and others that contain such creamer, or creamer/whitener, and/or creamer/thickener, and/or non-dairy creamer alternative, wherein the creamer, and/or creamer/whitener, and/or creamer/thickener, and/or non-dairy creamer alternative which contain triglyceride fats which are low in trans-unsaturated fatty acids (e.g. below 5% of the total fats present, preferably less than 2%). Still

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such creamer, and/or creamer/whitener, and/or creamer/thickener, and/or non-dairy creamer alternative should be not too difficult to manufacture in comparison to the conventional products, and should still perform well in a (savory) food composition comprising carbohydrates, in particular concerning processability, fat staining, crystallisation, mouthfeel, and other characteristics as mentioned above.

Preferably, such product should also be low in lauric acid or triglycerides thereof (e.g. below 10% of the total fats present, preferably less than 3%, most preferably less than 0.5% wt of the total fats present). Also, the alternative fats should combine well with the coating /encapsulation material. Suitable encapsulation material for the creamers etcetera according to the invention are edible proteins such as for example milk proteins, hydrolysed proteins, edible carbohydrates, such as for example starch or modified starches as well as sugars or sugar derivatives, dextrines or maltodextrines etcetera. The creamers in the form of encapsulated or covered fat usually contain 20-80% wt of encapsulation material, based on the total creamer. The manufacturing process usually involve a drying step, such as e.g. spray-dried but other drying processes such as for example heat drying (including vacuum freeze drying), air drying etc can also be employed.

Triglyceride fats can be grouped according to the fatty acids of which they consist. Such groups can be identified by a letter, and herein:

H means saturated fatty acid of 16 carbon atoms or longer (C16+, e.g. up to C24)

U means unsaturated fatty acids in cis conformation (any chain length)

E means unsaturated fatty acids in trans conformation (any chain length)

M means saturated fatty acids of 10-14 carbon atoms (C10-C14)

As the present application is about triglycerides of such fatty acids, the fatty acid composition of the triglycerides is given by for example:

H3 (meaning a triglyceride of 3 saturated fatty acids of 16 or more carbon atoms)

H2E (meaning a triglyceride of 2 saturated fatty acids of 16 or more carbon atoms and 1 trans-unsaturated fatty acid)

H2M (meaning a triglyceride of 2 saturated fatty acids of 16 or more carbon atoms and 1 saturated fatty acid of 10-14 carbon atoms)

H2U (meaning a triglyceride of 2 saturated fatty acids of 16 or more carbon atoms and 1 cis-unsaturated fatty acid)

HE2 (meaning a triglyceride of 1 saturated fatty acid of 16 or more carbon atoms and 2 trans-unsaturated fatty acids), and so on for other 3 letter codes.

Fat compositions can thus be characterised in containing certain weight percentages (based on the total amount of triglycerides) of triglycerides of the above codes.

Although it is mentioned for E and U that they may have any length, it is to be understood that this relates to fatty acids of approx. 8-24 carbon atoms, and more usually 16-20 carbon atoms.

Summary of the invention

It has now been found that the objectives as given above may be met (at least in part) by particulates comprising 10-90% wt (preferably 15-80% wt) of triglycerides of fatty acids, which particulates are at least partly covered or encapsulated by 10-90% wt (preferably 20-85%) of an encapsulating or covering material, wherein the amount of H3 (triglyceride of 3 saturated fatty acids of 16 or more carbon atoms) and H2U (triglyceride of 2 saturated fatty acids of 16 or more carbon atoms and one cis-unsaturated fatty acid) taken together in the creamer particulates is at least 55% wt based on the total amount of triglycerides, preferably at least 65% % wt based on the total amount of triglycerides. In other words: $H3 + H2U > 55\%$, preferably $> 65\%$ wt, based on total triglycerides.

This means that of the total amount of triglycerides present in the particulates at least 55% wt (preferably at least 65% wt) are triglycerides of fully saturated C16 and longer chains (e.g. C16, C18, C20, C22 and C24) and/or triglycerides containing one cis-unsaturated fatty acid of any chain length and two saturated fatty acids of 16 or more carbon atoms. In connection to this, it is believed that the creamers, whiteners, non-dairy cream alternatives, etcetera as currently on the market in particulate form contain about 30-50% of such $H3 + H2U$ triglycerides as part of their fats.

The preparations according to the invention are often dry preparations. However, such compositions still may contain a considerable amount of water, e.g. as a result of an incomplete dehydration process or as a result from water naturally present in the constituents, such as moisture in flour. The amount of moisture present in the compositions according to the invention is below 30% wt (based on the total composition), preferably less than 20% wt, more preferably less than 10%wt.

As is mentioned before, the fat blends are encapsulated by or (partly) coated with another material, e.g. hydrophilic film forming materials. In such encapsulates or partly coated fats, the individual fat blend particles as well as clusters of fat blend particles are at least partially

covered and/or surrounded by the encapsulation material. Such covering or encapsulation material preferably comprises a protein and/or a carbohydrate. Examples of such proteins protein are dairy protein, hydrolysed protein, gelatin, soy protein, or mixtures thereof. Examples of such carbohydrate are maltodextrin, a sugar, a sugar derivative, starch,
5 chemically modified starch, physically modified starch, xanthan, guar, locust bean gum, alginate, carrageenan, polydextrose, or mixtures thereof.

Following the invention, it is now possible to manufacture particulates, suitable as creamer and/or whitener and/or non-dairy cream alternative in food compositions, comprising 10-90%
10 wt (preferably 15-80% wt) of triglycerides of fatty acids, which particulates are at least partly covered or encapsulated by 10-90% wt (preferably 20-85%) of an encapsulating or covering material, wherein the triglycerides are selected such that they contain less than 5%, preferably less than 2% wt of trans-unsaturated fatty acids, and preferably having less than 10% wt (more preferably less than 3%, most preferably less than 0.5%) of lauric acid, and wherein the
15 fats still have appropriate melting and crystallisation behaviour.

Hence, it is now possible to manufacture e.g. creamer and/or whitener and/or non-dairy cream alternative-type products which contain a large proportion of vegetable fats, which composition is substantially free from trans-fatty acids or triglycerides thereof. Thus, the invention further
20 relates to a creamer and/or whitener and/or non-dairy cream alternative-type product comprising 10-90% wt (preferably 15-80% wt) of triglycerides of fatty acids, which particulates are at least partly covered or encapsulated by 10-90% wt (preferably 20-85%) of an encapsulating or covering material wherein at least 50% of the fats is of vegetable origin, and which composition is substantially free from trans-unsaturated fatty acids or triglycerides
25 thereof. Preferably, the compositions according to the invention are substantially free from animal fat.

The invention also relates to (savory) food compositions comprising the particulates according to the invention.

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Detailed description of the invention

In the particulates according to the invention it is preferred that the amount of H3 (triglyceride of 3 saturated fatty acids of 16 or more carbon atoms) is at least 15% wt based on the total amount of triglycerides in the particulates, preferably at least 20%. Likewise, it is preferred that
35 the amount of H2U (triglyceride of 2 saturated fatty acids of 16 or more carbon atoms and 1

cis-unsaturated fatty acid) taken together is at least 40% wt based on the total amount of triglycerides in the particulates.

5 Apart from the amounts of H3 and H2U it can be preferred to use fats in such particulates in a particular ratio. In this case, the ratio H3 : H2U is preferably between 0.5 and 1.2.

10 Regarding the basic fatty acid composition, it is preferred that the amount of H (i.e. saturated fatty acids of 16 or more carbon atoms) is between 60 and 75% wt based on total amount of fatty acids. Normally, only fatty acids are used with even number of carbon atoms. Similarly, it is preferred that the amount of U (cis-unsaturated fatty acids of any suitable chain length) is between 20 and 45% wt based on total amount of fatty acids.

15 In the particulates according to the invention the amount of palmitic fatty acid (C16:0) in the triglycerides is preferably between 40 and 60% wt based on the total amount of fatty acids.

20 The invention thus also relates to (savory) food compositions comprising the particulates as set out above, such as sauce and soup concentrates. Such (savory) food compositions according to the invention can be any physical format, but the invention is most suitable for savory compositions that are in the form of pasty or particulate matter. Particulate matter is herein to be understood to comprise e.g. flakes, powder, cubes, pellets, tablets. In the case of cubes, pellets, tablets it may be needed to use a technique such as agglomerating or pressing the particulates according to the invention to obtain such shapes. The (savory) food compositions as set out above usually contain additional material, such as 2-50% wt salt, 0-30% wt MSG, 0-20% wt herbs and/or spices, 0-30% wt vegetable particulates, 0-30% wt starch-based thickener and further comprising 0.1-30% wt of the particulates according to the invention.

30 The savory food compositions according to the invention will may further comprise (e.g. in an amount of 0.1-50% wt) one or more of the following ingredients: herbs and/or spices, tomato powder, vegetable pieces, monosodium glutamate and other components.

EXAMPLES

Example 1: manufacture of five different creamers

35 Five creamers were prepared having the net composition as given in the table below, by starting with a fat phase and an aqueous phase.

Creamer ingredients

Ingredients	Carboydrates*	*Fat	*Protelnes	*Others	Total
Product	(%)	(%)	(%)	(%)	(%)
Creamer a	69	15	14	2	100
Creamer b	11,5	75	10	3,5	100
Creamer c	15	78	7	0	100
Creamer d	20,5	65	14	0,5	100
Creamer e	44	50	6	0	100
*Carbohydrates					
wheat flour					
Maltodextrin					
Glucose syrup					
*Proteines					
Milkproteines					
*Others					
Phosphate					
citrate					
*Fat					
fat blends					

fat phase

- 5 Fat blends A-D were prepared from various known fats and fats specifically produced according to the top half of the table below. In the second half of that table the fatty acid composition is given in accordance with the definitions as herein defined, as is the ratio symmetric : asymmetric triglycerides for H2U.
- 10 2 Kg fat blend was prepared by mixing 1,2kg POs and 0,8 kg PO (blend A in the table below) and heated up 75°C in a blending vessel under nitrogen atmosphere for 10 min.
Other fat blends which can be used are B-D, with good properties. PO is palm oil. POs is a dry-fractionated palm stearin with a melting point of approx. 53°C. PO58 is fully hardened palm oil. Fatblend "comp" is a comparative, from the prior art, obtained by hardening palm oil to a melting point of approx. 44°C.
- 15

	comp	A	B	C	D
PO		40	30	40	20
POs		60	70	50	80
PO58				10	
PO44	100				
H3	12	25	27	31	29
H2E	29	0	0	0	0
H2M	1	1	1	2	1
H2U	21	46	45	42	44
HE2	10	0	0	0	0
H3/H2U	0.55	0.54	0.60	0.74	0.67
H	53	61	63	64	64
E	24	0	0	0	0
U	23	39	37	36	36
Palmitic	45	54	56	53	57
H3+H2U	33	71	72	72	73

Note: the numbers of all the fats given does not add up to 100%, as some minor amounts of other fats are also present.

aqueous phase

7 kg of an aqueous phase was prepared mixing:

5 5 kg water

1.3 kg fat blend/fat phase as above

0.22 kg maltodextrin

0.28 kg milkprotein

0.19 kg lactose

10 0.01 kg citrate

in a mixing tank with a Ultraturrax for 5 min. at 55°C and then homogenized in a homogenizer (Schroeder) one stage 200 bar. The resulting suspension then was spray dried in a multi stage spray dryer (Niro).

The inlet temperature was about 165 °C; the outlet temperature about 62°C.

15 The dry particulate creamer was agglomerated for 5 minutes in an agglomeration process step (Glatt Agglomerator)

Temperature:

Inlet temperature 80 °C

Outlet temperature 50 °C

- 5 The spray dried and agglomerated creamer was stored under cool conditions below 20°C and used in the formulations according to the examples below.

Example 2: Saffron cream soup

A dry soup mix for a saffron cream soup was made by mixing:

10	Creamer as in example 1-c	32,94%
	Heat/moisture-treated starch, dried	15,73%
	Skim milk powder	21,32%
	Xanthan	1,12%
	Common salt	4,51%
15	Citric acid granular	0,22%
	Powdered onion and leek	5,55%
	Sugar	2,50%
	Saffron powder	0,08%
	Various flavourings	16,03%

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To prepare the creamy saffron soup 40g of this dry mixture was stirred into 200ml cold water, mixed and briefly brought to the boil.

Example 3: Mushroom cream soup

- 25 A dry soup mix for a mushroom cream soup was made by mixing:

	Creamer according to example 1-e	28,40%
	Heat/moisture-treated starch, dried	14,76%
	Skim milk powder	22,14%
	Xanthan	1,05%
30	Common salt	4,22%
	Citric acid granular	0,40%
	Powdered onion and leek	5,18%
	Sugar	1,10%
	Powdered mushrooms and ceps	14,49%
35	Various flavourings	8,26%

To prepare the creamy mushroom soup 40g of this dry mixture was stirred into 200ml cold water, mixed and briefly brought to the boil.

Example 4: Tomato cream sauce

5 A dry sauce mixture for a creamy tomato sauce was made by mixing:

	Creamer according to example 1-a	28,40%
	Heat/moisture-treated starch, dried	14,76%
	Tomato powder	36,63%
	Xanthan	1,05%
10	Common salt	4,22%
	Citric acid granular	0,40%
	Powdered onion and leek	5,18%
	Sugar	1,10%
	Various flavourings	8,26%

15 To prepare the creamy tomato sauce 40g of this dry mixture was stirred into 200ml cold water, mixed and briefly brought to the boil.

Example 5: leek cream-style sauce

A dry sauce mixture for a leek cream-style sauce was made by mixing:

20	Creamer according to example 1-d	28,40%
	Heat/moisture-treated starch, dried	14,76%
	Leek powder	36,63%
	Xanthan	1,05%
	Common salt	4,22%
25	Citric acid granular	0,40%
	Powdered onion and leek	5,18%
	Sugar	1,10%
	Various flavourings	8,26%

30 To prepare the creamy tomato sauce 40g of this dry mixture was stirred into 200ml cold water, mixed and briefly brought to the boil.

Example 6: creamer-cube

Following the process in patent EP 0779 039 a formed cream substitute was prepared by mixing 32,5 g spray dried cream powder (having a fat content of 75%) according to example

35 1-b with 32,5g spray dried creamer (including fat blend) on the basis of caseinate, having a fat

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content of 75% and the mixture was mixed in 35g of heated butter fat. The paste-like mass was extruded and formed into cubes of 7g each by a conventional molding machine.

5 The cubes so-obtained were equivalent in providing creaminess to that of an amount of at least 2 tablespoons of cream. This is the amount which is generally used for refining 250 ml of food. The cubes were dispersible in hot meals and were equivalent to the addition of cream as to whitening power, creaminess, sensation in the mouth and taste. The addition of the cubes unlike the addition of cream, did not lead to a dilution of the taste or the consistency of the meals. It was possible to store the cubes without cooling.

CLAIMS

1. Particulates comprising 10-90% wt (preferably 15-80% wt) of triglycerides of fatty acids, which particulates are at least partly covered or encapsulated by 10-90% wt (preferably 20-85%) of an encapsulating or covering material, wherein the amount of H3 (triglyceride of 3 saturated fatty acids of 16 or more carbon atoms) and H2U (triglyceride of 2 saturated fatty acids of 16 or more carbon atoms and 1 cis-unsaturated fatty acid) taken together is at least 65% wt based on the total amount of triglycerides.
2. Particulates according to claim 1 wherein said amount of H3 + H2U is at least 65% wt based on the total amount of triglycerides.
3. Particulates according to claim 1-2, wherein the covering or encapsulation material comprises a protein and/or a carbohydrate.
4. Particulates according to claim 3, wherein the protein comprise a dairy protein, hydrolysed protein, gelatin, soy protein, or mixtures thereof.
5. Particulates according to claim 3, wherein the carbohydrate comprises a maltodextrin, a sugar, a sugar derivative, starch, chemically modified starch, physically modified starch, xanthan, guar, locust bean gum, alginate, carrageenan, polydextrose, or mixtures thereof.
6. Particulates according to claim 1-5, which particulates contain less than 30% wt (preferably less than 20% wt) of water.
7. Particulates according to claim 1-6, suitable as a creamer and/or whitener and/or non-dairy cream alternative in food compositions.
8. Particulates according to claim 1-7, wherein the amount of H3 (triglyceride of 3 saturated fatty acids of 16 or more carbon atoms) is at least 15% wt based on the total amount of triglycerides, preferably at least 20%.

9. Particulates according to claim 1-8, wherein the amount of H2U (triglyceride of 2 saturated fatty acids of 16 or more carbon atoms and 1 cis-unsaturated fatty acid) taken together is at least 40% wt based on the total amount of triglycerides.
- 5 10. Particulates according to claim 1-9, wherein the ratio H3 : H2U is between 1: 0.5 and 1:1.2.
- 10 11. Particulates according to claim 1-10, wherein the amount of H is between 60 and 75% wt based on total amount of fatty acids.
12. Particulates according to claim 1-11, wherein the amount of U is between 20 and 45% wt based on total amount of fatty acids.
- 15 13. Particulates according to claim 1-12, wherein the amount of palmitic fatty acid (C16:0) based on the total amount of fatty acids is between 30 and 70% wt.
14. Particulates according to claim 1-13, wherein the particulates are in the shape of flakes, granules, powder, cube, pellet, or tablet.
- 20 15. Non-dairy cream alternative in the form of a cube, pellet or tablet comprising the particulates according to claim 1-14
- 25 16. Composition comprising 2-50% wt salt, 0-30% wt MSG, 0-20% wt herbs and/or spices, 0-30% wt vegetable particulates, 0-30% wt starch-based thickener and further comprising 0.1-30% wt of the particulates according to claim 1-15.
17. Composition according to claim 16, in the form of flakes, granules, powder or agglomerated or pressed to a cube, pellet, or tablet.
- 30 18. Composition according to claim 16-17, which is a soup- or sauce concentrate.

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ABSTRACT

Particulate compositions which contain fat suitable for use as e.g. creamer and/or whitener,
and in particular comprising triglycerides of fatty acids, wherein the composition is low in
5 triglycerides of trans-unsaturated fatty acids. The invention further relates to food products
containing such creamer.

PCT Application
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